CLAIMS

We claim,

1. Electroprocessed collagen.

2. The electroprocessed collagen of Claim 1, in a matrix.

3. The electroprocessed collagen matrix of Claim 2, further comprising one or more substances.

4. The electroprocessed collagen matrix of Claim 3, wherein the one or more substances is cells.

5. The electroprocessed collagen matrix of Claim 4, wherein the one or more substances is a growth factor, differentiation inducer, anti-oxidant, vitamin, hormone, nucleic acid, drug, peptide, nucleic acid, emollient, humectant, conditioner or cosmetic.

6. The electroprocessed collagen matrix of Claim 1, further comprising additional electroprocessed material, wherein the additional electroprocessed material is one or more natural materials, one or more synthetic materials, or a combination thereof.

7. The electroprocessed collagen matrix of Claim 6, wherein the natural material comprises one or more amino acids, peptides, denatured peptides, polypeptides, proteins, carbohydrates, lipids, nucleic acids, glycoproteins, lipoproteins, glycolipids, glycosaminoglycans, proteoglycans, or a combination thereof.

8. The electroprocessed collagen matrix of Claim 6, wherein the synthetic material comprises one or more polymers.

9. An engineered tissue comprising the electroprocessed collagen matrix of Claim 2 and cells.

10. The engineered tissue of Claim 9, wherein the cells are stem cells, committed stem cells, or differentiated cells.

11. The engineered tissue of Claim 9, wherein the cells comprise fibroblast cells, the electroprocessed collagen comprises Type I collagen, and the electroprocessed collagen matrix further comprises electroprocessed elastin.

12. The engineered tissue of Claim 9, wherein the cells comprise chondrocyte cells, and the electroprocessed collagen comprises Type II collagen.

13. A construct comprising the electroprocessed collagen matrix of Claim 2.

14. The construct of Claim 13, wherein the construct is a prosthesis and the electroprocessed collagen matrix forms a coating on one or more surfaces of the prosthesis.

15. The construct of Claim 13, wherein the construct is stent, a prosthetic blood vessel, a prosthetic heart, a prosthetic heart valve, a prosthetic heart valve leaflet, an outer sleeve reinforcement for a blood vessel, a prosthetic ligament, a prosthetic muscle, prosthetic cartilage, prosthetic bone, prosthetic skin, a dural patch, a prosthetic tendon, a nerve guide, a dental prosthesis, a prosthetic liver, a prosthetic pancreas, a cosmetic augmentation, an orthopedic screw, a component of any of the foregoing constructs, or a combination of any of the foregoing constructs.

16. The construct of Claim 13 wherein the construct has a substantially cylindrical shape and wherein the construct comprises:

an outer wall comprising the electroprocessed collagen matrix, wherein the electroprocessed collagen matrix comprises Type I collagen and elastin;

an inner wall comprising a second electroprocessed matrix, wherein the second electroprocessed collagen matrix comprises Type I collagen and elastin;

fibroblast cells seeded upon an exterior surface of the outer wall;

smooth muscle cells seeded upon an interior surface of the outer wall and an exterior surface of the inner wall;

endothelial cells seeded upon an interior surface of the inner wall; and

a lumen within the interior surface of the inner wall.

17. The construct of Claim 13, wherein the construct has a substantially cylindrical shape and a lumen, the electroprocessed collagen matrix comprises Type I collagen, poly(lactic acid), and poly(glycolic acid), and myoblast cells are contained within the lumen of the construct.

18. A method of delivering a substance to a desired location comprising;

combining the substance with the electroprocessed collagen of Claim 1; and,

placing the electroprocessed collagen containing the substance in the desired location.

19. A method of delivering a substance to a desired location comprising;

adding a substance to the electroprocessed collagen matrix of Claim 2; and,

placing the electroprocessed collagen matrix containing the substance in the desired location.

20. A method of manufacturing the electroprocessed collagen of Claim 1, comprising:

electrodepositing one or more electrically-charged solutions comprising collagen or molecules capable of forming collagen onto a grounded target substrate under conditions effective to electrodeposit collagen or molecules capable of forming collagen on the substrate to form the electroprocessed collagen.

21. A method of manufacturing the electroprocessed collagen matrix of Claim 2, comprising:

electrodepositing one or more electrically-charged solutions comprising collagen or molecules capable of forming collagen onto a grounded target substrate under conditions effective to electrodeposit collagen or molecules capable of forming collagen on the substrate to form the electroprocessed collagen matrix.

22. A method of manufacturing the engineered tissue of Claim 9, comprising:

electrodepositing one or more electrically-charged solutions comprising collagen or molecules capable of forming collagen, and cells, onto a grounded target substrate under conditions effective to deposit the electroprocessed collagen or molecules capable of forming collagen and the cells onto the substrate.

23. A method of manufacturing the engineered tissue of Claim 9, comprising:

electrodepositing one or more electrically-charged solutions comprising collagen or molecules capable of forming collagen onto a grounded target substrate under conditions effective to deposit the electroprocessed collagen or molecules capable of forming collagen; and,

applying cells onto the substrate or into a stream of the electroprocessed collagen or molecules capable of forming collagen, wherein the stream is located between the grounded target substrate and the solutions.

24. A method of evaluating a biological response of a cell to a substance, comprising:

applying the substance to the electroprocessed collagen matrix and cells of Claim 3; and,

evaluating the biological response of the cell.